CLAIMS

We claim:

1. An optical fiber distribution frame including:

- a first cross-connection panel (B1) and a second cross-connection panel (B2) facing each other, and

- a first set of connection modules (12) belonging to said first cross-connection panel, and a second set of connection modules belonging to said second cross-connection panel, each module of the first set being adapted to be connected to one end of an optical fiber (R) of a first group of fibers, each module of the second set being adapted to be connected to one end of an optical fiber (E) of a second group of fibers, and an optical fiber of the first group being adapted to be connected to an optical fiber of the second group by a jumper fiber (FL) which has two ends (e1, e2) respectively received in a port of one of the modules of the first set and in a port of one of the modules of the second set, wherein said first panel comprises at least one first connection module support to which are mounted at least some of said first set of modules, and said second panel comprises at least one first connection module support to which are mounted at least some of said second set of modules, wherein said first and second panels each include a second connection module support (7), and said second connection module supports cooperate with each other to form a stowage area for jumper fibers (FL) that are not in use.

2. A distribution frame according to claim 1, wherein said second connection module supports face each other.

3. A distribution frame according to claim 1, wherein the jumper fibers (FL) not in use are connected parallel to each other between the second connection module support (7) on the first panel (B1) and the second connection module support (7) on the second panel (B2), each jumper fiber being arranged directly above the preceding one as and when it is stowed.

4. A distribution frame according to claim 1, wherein the jumper fibers (FL) are all the same length.

5. A distribution frame according to claim 1, wherein the first and second cross-connection panels each have first and second opposite sides respectively extending in a first direction (X) and a second direction (Y), and the first and second connection module supports (7) of the first cross-connection panel and the first and second connection module supports (7) of the second cross-connection panel are adapted to rotate about a respective spindle (8) extending in the first direction (X) so that each support (7) is adapted to be swung between a rest position (PR), in which the support (7) extends toward the exterior of the distribution frame at an angle (α) to the first direction (Y), and a working position (PT), in which the support extends in the second direction (Y).

6. A distribution frame according to claim 1, wherein each second connection module support (7) is on one side of the associated cross-connection panel.

7. A distribution frame according to claim 1, wherein the ends (e1, 20; e2, 20) of each jumper fiber (FL) extend in a third direction (Z).

8. A distribution frame according to claim 1, wherein test means (31) are adapted to test remotely any optical fiber (R) of the first group and/or any optical fiber (E) of the second group continuously or in response to a reported fault.

9. A method of connecting a jumper fiber (FL) in a distribution frame according to claim 1, comprising:

- a) moving the device into the stowage area,
- b) disconnecting a first jumper fiber (FL) end (e1, 20) connected to the second support (7) on the first cross-connection panel (B1) in said stowage area,
- c) moving said first fiber end (e1, 20) toward the first support (7) on the first cross-connection panel (B1),
- d) connecting said first fiber end (e1, 20) to a port of a module (12) on said first support,
- e) moving the device into the stowage area,
- f) disconnecting a second fiber end (e2, 20) connected to the second support

(7) on the second cross-connection panel (B2) in said stowage area,

- g) moving said second fiber end (e2, 20) toward the first support (7) on the second cross-connection panel (B2), and

- h) connecting said second fiber end (e2, 20) to a port of a module (12) on said first support (7) on the second cross-connection panel (B2).

10. A method according to claim 9, wherein the jumper fiber (FL) to be disconnected in the stowage area is at the highest level of that area.

11. A method according to claim 9, wherein said jumper fiber (FL) is connected above the mass of jumper fibers in use.

12. A method of disconnecting a jumper fiber (FL) in a distribution frame according to claim 1, comprising:

- a) moving the device into the area between the first support (7) on the first cross-connection panel (B1) and the first support (7) on the second cross-connection panel (B2),

- b) disconnecting a second end (e2, 20) of said fiber connected to the first support (7) on the second cross-connection panel (B2),

- c) releasing said second fiber end (e2, 20) into the mass of jumper fibers (FL) in use,

- d) disconnecting a first end (e1, 20) of the fiber connected to the first support

(7) on the first cross-connection panel (B1),

- e) extracting said jumper fiber (FL) from the distribution frame by an extractor device, and

- f) connecting said jumper fiber (FL) in the stowage area.

13. A method according to claim 12, wherein during the step (e) traction is applied to said first end (e1, 20) of said jumper fiber (FL),

14. A method according to claim 13, wherein traction is applied to the jumper fiber (FL) above the first cross-connection panel (B1).

15. A method according to claim 12, wherein the jumper fiber extractor device includes a pair of rollers (29) between which said jumper fiber (FL) passes and which can be driven in rotation to feed said jumper fiber.

16. A method according to claim 15, wherein the rollers (29) are covered with an elastically deformable material to conform to the shape of said jumper fiber as it passes between the rollers.

17. A method according to claim 12 which in steps b) and d):

- 1) the device is moved in the first direction (X), the second direction (Y) and the third direction (Z) in the vicinity of a port of a connection module on a support (7) in

the working position, to which port said fiber end is connected, in order to position the holding member (16) substantially on the axis of said port,

- 2) the device is moved in the third direction (Z) towards the connection module (12) until said fiber end enters the slot (19) of the holding member (16),

- 3) the retaining member (22) is moved in the first direction (X) to its working position to fasten said fiber end to it,

- 4) the device is moved in the third direction (Z) a small distance away from the connection module (12), and

- 5) said support (7) is swung into the rest position.

18. A method according to claim 12, wherein, during step f):

- 1) the device is moved in the first direction (X), the second direction (Y) and the third direction (Z) in the vicinity of a port of a connection module (12) on the support (7) in the working position, to which port said fiber end is connected, in order to position the holding member (16) substantially on the axis of said port,

- 2) said retaining member (22) is moved in the first direction (X) to its rest position to separate said fiber end to be connected from the holding member (22),

- 3) the pusher member (24) is moved in the third direction (Z) towards the connection module (12) to extract said fiber end from the holding member (16),

- 4) the device is moved in the third direction (Z) towards the connection module (12) until said fiber end is connected to the latter, and

- 5) the device is moved in the third direction (Z) away from the connection

module (12).

19. A method according to claim 9 which in steps b) and f):

- 1) the device is moved in the first direction (X), the second direction (Y) and the third direction (Z) in the vicinity of a port of a connection module on a support (7) in the working position, to which port said fiber end is connected, in order to position the holding member (16) substantially on the axis of said port,

- 2) the device is moved in the third direction (Z) towards the connection module (12) until said fiber end enters the slot (19) of the holding member (16),

- 3) the retaining member (22) is moved in the first direction (X) to its working position to fasten said fiber end to it,

- 4) the device is moved in the third direction (Z) a small distance away from the connection module (12), and

- 5) said support (7) is swung into the rest position.

20. A method according to claim 9, wherein, during steps d) and h):

- 1) the device is moved in the first direction (X), the second direction (Y) and the third direction (Z) in the vicinity of a port of a connection module (12) on the support (7) in the working position, to which port said fiber end is connected, in order to position the holding member (16) substantially on the axis of said port,

- 2) said retaining member (22) is moved in the first direction (X) to its rest position to separate said fiber end to be connected from the holding member (22),

- 3) the pusher member (24) is moved in the third direction (Z) towards the connection module (12) to extract said fiber end from the holding member (16),

- 4) the device is moved in the third direction (Z) towards the connection module (12) until said fiber end is connected to the latter, and

- 5) the device is moved in the third direction (Z) away from the connection module (12).